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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/030,144

04/30/2002

Dino Manfredi

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EXAMINER

OSELE, MARK A

ART UNIT

PAPER NUMBER

1734

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/030,144

Applicant(s)

MANFREDI ET AL.

Examiner

Mark A. Osele

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-53 is/are pending in the application.
4a) Of the above claim(s) 35,36,46 and 47 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 29-34,37-45 and 48-53 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 29, 32-33, 37, 40, 43, 48, 51, and 53 are rejected under 35 U.S.C. 103(a) as obvious over Jones in view of Akimoto et al. Jones shows a method of introducing a chemical compound into an extruder comprising: introducing a material into the extruder (column 1, lines 23-35); introducing at least one mixture of a chemical compound and carbon dioxide into the extruder (column 5, lines 14-37) by an introduction device comprising two pumps, 14, 30, a mixing chamber, A, and an injector; and extruding the material together with the mixture. Jones further shows the material to be extruded and the chemical compound are in fluidized states and the carbon dioxide to be precooled. Jones shows all of the instantly claimed limitations except for a feed zone, a compression zone, and a discharge zone reaction between one of the chemical compounds and the polymeric material. The feed zone, compression zone, and discharge zone are all conventional extruder elements. It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the conventional extruder elements to the method of Jones because these elements are known to be basic parts for extruding polymeric materials.

Akimoto et al. teaches that a cross-linking agent can be concurrently injected with a blowing agent into an extruder (column 2, lines 40-51, 60-68). It would have been obvious to one of ordinary skill in the art at the time the invention was made to mix the cross-linking agent of Akimoto et al. into the carbon dioxide blowing agent mixture of Jones because Akimoto et al. teaches the need for both a blowing agent and a cross-linking agent. Jones teaches that if two or more chemical compounds are being simultaneously injected into an extruder it is advantageous to mix them prior to injection.

Regarding claims 32 and 33, Akimoto et al. teaches the polymer to be polyvinyl chloride (column 2, lines 34-35) and Jones teaches the mixture of blowing agents is applicable for extruded polymer foams (column 1, lines 23-34).

Regarding claims 37 and 48, Jones shows the chemical compound to be a liquid at room temperature (column 5, lines 21-23).

Regarding claim 43, the cross-linking occurring in the method of Akimoto et al. is a polymerization reaction.

Regarding claims 40 and 51, Jones appears to show in the figures that the injector is perpendicular to the barrel of the extruder, but even if this is not clearly shown it would have been obvious to one of ordinary skill in the art that placing the injector perpendicular to the barrel of the extruder would guarantee interaction between the material in the extruder and the mixture being injected.

Regarding claims 42 and 53, It would have been obvious to one of ordinary skill in the art at the time the invention was made to add an agitation system to the mixing

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chamber of the references as combined because agitators are conventional devices to ensure that chemicals are thoroughly intermixed.

3. Claims 30, 31, 38-39, 41, 44, 45, 49-50, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones in view of Akimoto as applied to claims 29 and 43 above, and further in view of Okamoto et al. (U.S. Publication 2001/0018121). Okamoto et al. teaches that a preferred blowing agent for the polymer is a supercritical carbon dioxide (paragraph 0049) at die pressures of anywhere from 2190 psi (151 bar) to 3730 psi (257 bar) (Examples 2, 3, 4, 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use supercritical carbon dioxide in the method of the references as combined because Okamoto et al. teaches that this blowing agent is preferable. Regarding claims 30 and 44, it would have been obvious to use the instantly claimed temperature because this temperature is proper for supercritical carbon dioxide at these pressures.

Regarding claims 31 and 45, Okamoto et al. teaches that the supercritical carbon dioxide is injected into the extruder at a location where the polymer is a liquid (paragraph 0052).

Regarding claims 38 and 49, Okamoto et al. teaches that the addition of talc to the supercritical carbon dioxide allows for a lesser amount of blowing agent to achieve the same result (paragraph 0050). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add talc, which is a solid at room temperature into the blowing agent of the references as combined above. Furthermore,

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it would have been obvious to one of ordinary skill in the art at the time the invention was made to fluidize the talc to ensure that the talc is thoroughly mixed in the blowing agent.

Regarding claims 41 and 52, Okamoto et al. teaches that each blowing agent inlet comprises multiple orifices (paragraph 0053). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the large number of blowing agent inlets and orifices because Okamoto et al. teaches that this arrangement provides appropriate mixing. In addition, the large number of orifices indicates that some of the orifices will emerge tangentially to the extrusion screw flights.

4. Claims 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones in view of Akimoto as applied to claims 32 above, and further in view of Barbieri et al. (U.S. Patent 5,883,197). Barbieri et al. teaches that an alternative polymer used in foaming and extrusion is vinylidene fluoride (Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use vinylidene fluoride as the polymer of the references as combined because Barbieri et al. teaches this polymer to be an extruded polymer foam and Jones teaches the mixture of blowing agents is applicable for extruded polymer foams (column 1, lines 23-34).

Response to Arguments

5. Applicant's arguments filed April 25, 2005 have been fully considered but they are not persuasive. Applicants argue that Jones in view of Akimoto et al. fail to show a

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number of claimed elements. Applicants first argue that the injection device of Jones is not used for an extruder. Jones indicates that the blowing agent is mixed for injection into an extruder (abstract, column 1). Applicants also argue that there is no reaction between the polymer and the chemical compounds. The cross linking agent of Akimoto et al. performs a chemical reaction with the polymer when it cross links the molecules. Furthermore this cross linking is further polymerization, so even if the material entering the extruder is in a polymeric state, further polymerization occurs in the extruder by reaction with the cross linking agent.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A. Osele whose telephone number is 571-272-1235. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



MARK A. OSELE
PRIMARY EXAMINER

October 2, 2006